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Alfa Laval Unique PMO Plus® CP Mixproof Vertical Tank Valve

Double seat valves

Introduction

The Alfa Laval Unique PMO Plus® CP Mixproof Vertical Tank Valve is a flexible, easy-to-service double block-and-bleed valve that is specially designed for vertical mounting under a tank.

The valve is based on the well proven and exceptionally versatile principle of the Unique Mixproof valves from Alfa Laval. It enables one product in the tank on one side of the two valve plugs while allowing cleaning media to flow through the valve body for effective Cleaning-in-Place operations – without the risk of cross-contamination.

The valve provides exceptional spillage-free operation and is compliant with most hygienic standards, including the 3-A Sanitary Standards, the Pasteurized Milk Ordinance and the seat lift requirements of the US Food and Drug Administration. With its modular design and a wide variety of options, the valve can be customized to meet any process requirement and provides low total cost of ownership.

Application

The Unique PMO Plus CP Mixproof Vertical Tank Valve is designed for continuous flow management and process safety in hygienic processes where product safety is at the top of the agenda across the dairy, food, beverage and many other industries.

Benefits

- Complies with the Pasteurized Milk Ordinance (PMO)
- Enhanced product safety
- Cost-effective, spillage-free operation
- Optimized plant efficiency and enhanced cleanability
- Leakage detection and leakage chamber cleaning


Standard design

The Alfa Laval Unique PMO Plus CP Mixproof Vertical Tank Valve is comprised of a series of base components, including valve body, valve plug, actuator, and cleaning options and accessories that support a wide range of applications. Leakage detection holes enable visual inspection without requiring valve disassembly and provide advance notification



of parts wear. Few straightforward moveable parts contribute to reliable operation and reduced maintenance costs. The valve can also be fitted with the Alfa Laval ThinkTop V70 for sensing and control of the valve.

Certificates

 Authorized to carry the 3A symbol

TECHNICAL DATA

Temperature

Temperature range: 23°F to +257°F (depending on rubber quality)

Pressure

Max. product pressure in pipeline: 145 PSI (1000 kPa)

Min. product pressure: Full vacuum

Air pressure: Max. 116 PSI (800 kPa)

PHYSICAL DATA

Materials

Product wetted steel parts: 1.4404 (316L)

Other steel parts: 1.4301 (304)

External surface finish: Bright (polished)

Internal surface finish: Bright (polished), Ra <32 μ"

Product wetted seals: EPDM, HNBR, NBR or FPM

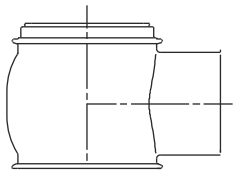
Guide strips: PTFE

Other seals:

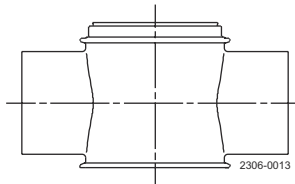
CIP seals: EPDM

Actuator seals: NBR

Valve body combination



Type 20



Type 30

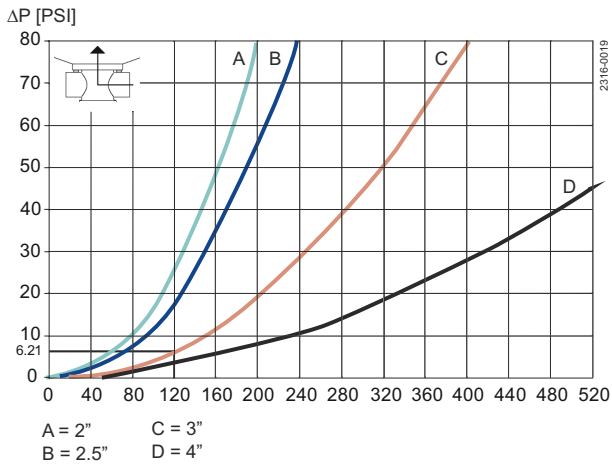
State of the art

The Unique PMO Plus® CP Mixproof Vertical Tank Valve also provides a state of the art solution when there is no CIP pressure or flow from the tank side to clean the seat and plug. The valve is self-cleaning, thanks to two Clean-in-Place (CIP) nozzles. The first nozzle is designed specifically for plug cleaning. This double-acting nozzle projects cleaning solution through the tank connection, ensuring complete cleaning of the seat contact surfaces as well as the shadow area of the tank port. The second is a rotating CIP nozzle incorporated into the unit for optimum cleaning of the full-bore leakage chamber.

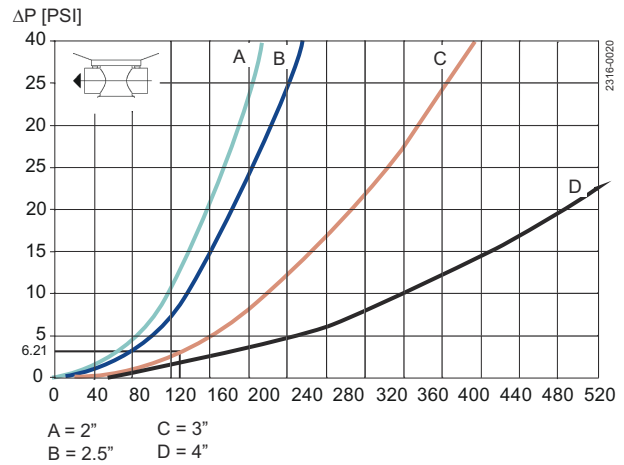
The valve can be connected with the tank via a weld in tank flange or a pipe end flange.

The 4" model feature a 1.77 inches opening, which enables the passage of very large particles or efficient handling of high viscosity fluids.

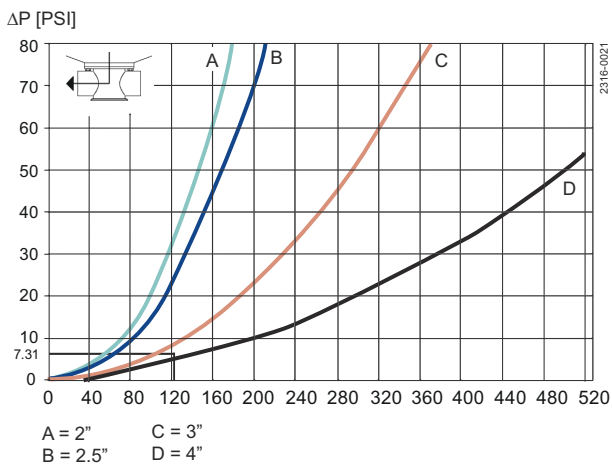
Pressure drop/capacity diagrams



To tank (fig. 1)



Straight through (fig. 3)



From tank (fig. 2)

Example to determine pressure drop at a given flow rate:

To tank:	3". Capacity = 120 gpm
From tank:	3". Capacity = 120 gpm
Straight through:	3". Capacity = 120 gpm

Result:

From fig. 1, $\Delta p = 6.21$ psi to tank

From fig. 2, $\Delta p = 7.31$ psi from tank

From fig. 3, $\Delta p = 4.09$ psi straight through



Note!

For the diagrams the following applies:

Medium: Water (68°F).

Measurement: In accordance with VDI 2173.

Size inch	Max. size of particle (inch)	Max. tank pressure (PSI)	Actuator size 4-Basic (ø6.2"x10")	Actuator size 5-Basic (ø7.3"x11")	Opening pressure in pipe line at 87 PSI air pressure (kPa)
2"	1.26	85	Standard		145
2½"	1.26	85	Standard		145
3"	1.26	85	Standard		145
4"	1.77	85		Long stroke	145



Note!

Max. pressure in tank means that a higher pressure in tank will open the valve.
 It is possible to open with 145 PSI (10 bar) (1000 kPa) in pipe line.
 When closing the valve the pressure can not be higher than "Max. Tank pressure".

Air and CIP consumption

Size	DN/OD			
Inch	2"	2½"	3"	4"
Cv-value				
Upper Seat-lift [gpm/psi]	2.6	2.6	2.6	5.3
Lower Seat-lift (tank seat lift) [gpm/psi]	30	30	30	58.25
Air consumption				
Upper Seat-lift * [cubic inches]	24	24	24	38
Lower Seat-lift (tank seat lift) * [cubic inches]	8	8	8	13
Main Movement * [cubic inches]	99	99	99	216
Cv-value - SpiralClean				
External CIP in leakage chamber [gpm/psi]	1.59	1.59	1.59	1.59



Note!

* [cubic inches] = volume at atmospheric pressure
 Recommended min. pressure for External CIP in leakage chamber: 44psi

Formula to estimate CIP flow during seat lift

(for liquids with comparable viscosity and density to water):

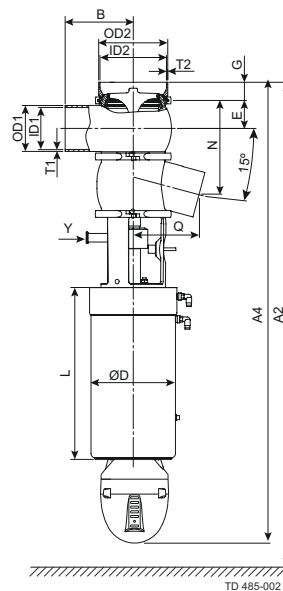
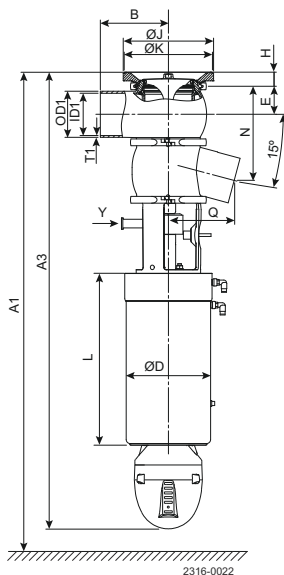
$$Q = C_v \cdot \sqrt{\Delta p}$$

$$Q = \text{CIP - flow (gpm)}$$

C_v = C_v value from the above table.

Δp = CIP pressure (psi).

Dimensions (inch)



	2"	2.5"	3"	4"
A1	35.039	36.614	36.220	47.638
A2	35.433	37.008	36.614	48.031
A3	28.858	29.882	29.961	39.449
A4	29.252	30.276	30.354	39.843
B	4.331	4.331	4.331	5.906
OD1	2.008	2.500	2.996	4.000

	2"	2.5"	3"	4"
ID1	1.882	2.374	2.870	3.843
t1	0.063	0.063	0.063	0.079
OD2	4.000	4.000	4.000	6.000
ID2	3.843	3.843	3.843	5.782
t2	0.079	0.079	0.079	0.109
øD	7.323	7.323	7.323	7.323
E	1.453	1.699	1.947	2.433
F1	1.496	1.496	1.496	2.953
F2 (Tank plug)	0.394	0.394	0.394	0.394
G	1.575	1.575	1.575	1.575
H	1.220	1.220	1.220	1.220
øJ	7.835	7.835	7.835	7.835
øK	7.677	7.677	7.677	7.677
L	9.921	9.921	9.921	14.921
N	4.949	5.709	5.555	8.185
Q	4.445	4.508	4.571	6.220
Y	¾" clamp ferrule	¾" clamp ferrule	¾" clamp ferrule	¾" clamp ferrule
M/Tri-clamp	0.827	0.827	0.827	0.827
Weight (lb)	26.2	27.3	28.6	88.9



Note!

A1 + A2 = min. installation measure to allow that actuator and internal parts can be lifted out of the valve body.

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